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National Aeronautics and Space Administration.
Glenn Research Center.
Plum Brook Station.

Decommissioning news.

A quarterly newsletter to inform the public about NASA's Decommissioning Activities

Seventeenth Edition. October 2005.

Come for Learning Come for Fun Join Us at Our Annual Community Information Session Tuesday October 18.

It's about science and technology in action. A chance to learn something new, enjoy light refreshments and see old friends. On Tuesday, October 18, (7 p.m. through 9 p.m.), NASA's annual Decommissioning Community Information Session returns to BGSU Firelands in Huron, at the state-of-the-art Cedar Point Center.

The Community Information Session (CIS) is NASA's opportunity to update the public on progress made in decommissioning the Reactor Facility at NASA Plum Brook Station, during a year of many accomplishments. Members of NASA's Decommissioning Team, as well as the Community Workgroup that provides an important communication vehicle between NASA and the public, will be on hand to meet members of the community and answer questions. A quarterly Workgroup meeting will begin at 5:30 p.m. and is also open to the public.

Visitors to the CIS can browse a series of displays, hear an update from the Decommissioning Team and climb aboard the Aero Bus, a traveling exhibit from the NASA Glenn Research Center. The Aero Bus spreads the word on research and environmental programs and also shows videos of NASA missions. The evening will also include information on other NASA programs, and a chance to view some of the documentary video on the Reactor Facility, "Of Ashes and Atoms" (seating is limited). According to Sally Harrington, NASA Glenn Public Affairs Specialist, "The CIS is informational and fun for kids and adults alike. Folks are welcome to drop by for a few minutes or stay for the whole program."

The CIS provides educational opportunities for students of all ages. "So much of what NASA does is about science, math and engineering, not only in space but here on earth," says Decommissioning Project Manager Tim Polich. "We welcome the chance to meet students and their parents." Adds Danette Johnson, BGSU Firelands Director of Educational Outreach, "The Cedar Point Center is pleased to host the Community Information Session. This is the kind of program we're happy to sponsor - something of educational value to everyone from grade school students to grandparents. We hope the public will join us for an exciting event." ■

Thanks, Tim.

Decommissioning News says thanks and good luck to Project Manager Tim Polich, who - as of the printing of this edition - has departed NASA Plum Brook Station for U.S. Navy duty in Hawaii. A Commander in the Naval Reserve, Tim was called to active duty at the Navy Shipyard in Pearl Harbor.

From its earliest days, Tim shepherded the Decommissioning Project through a variety of regulatory and technical challenges - amassing a long list of accomplishments as well as an impressive record of safety and community goodwill.

We wish all the best for Tim, his wife, Dana, and their children. And, having shared seven Ohio winters with us, we hope Tim can somehow brave the Hawaiian weather.

Before he left, Tim shared some last public thoughts on decommissioning in this newsletter's articles. Thanks, Tim.

Decommissioning Update:
Lessons Learned Lead to NASA's Next Steps on Project.

This edition of the newsletter appears during Major League Baseball's postseason. Many a team will take a lead into the bottom of the ninth inning, with its best relief pitcher looking to close out the game - and find that the last three outs are the hardest to get. It might be said that the Decommissioning Project is at a similar juncture.

Since work began, NASA has removed more than 98 percent of the radioactive inventory that was on site. In this most pivotal year, workers completed reactor tank segmentation, removed and shipped virtually all fixed equipment from Reactor Facility buildings and structures, and excavated 10 million pounds of lightly contaminated soil. Before terminating its Reactor Facility license with the U.S. Nuclear Regulatory Commission (NRC), NASA must meet strict project cleanup levels and remove the remaining two percent of contamination that is spread throughout embedded piping (pipe systems surrounded by concrete) at least three feet, and as much as 30 feet, below grade, and found in the concrete of the buildings' walls, floors and roofs, and in some remaining soil. NASA began decontaminating concrete in some buildings in 2004 and undertook initial work on embedded piping last winter. The original plan was to clean the piping and leave it in place until NASA had terminated its license, then demolish the buildings and use the clean concrete as fill. But in February, based on the pipes' condition, NASA decided to halt decontamination and reexamine its approach.

Decontamination Challenges Evaluated.

According to Senior Project Engineer Keith Peecook, "The discovery of more challenging conditions than anticipated …raised questions about the best way to complete decommissioning." From March through June, an Evaluation Team, representing project contractor MWH Constructors, NASA personnel and others, worked to examine several options. Peecook said the team evaluated the cost and technical challenges of cleaning pipes and leaving them in place using a variety of decontamination methods, as compared to demolishing the buildings and removing the pipes with the other debris as low-level radioactive waste. NASA recognized that while this approach would save on time and decontamination costs, it would dramatically increase the costs of waste packaging, shipping and disposal at the Envirocare licensed facility in Utah.

Part of the evaluation involved a so-called "proof of process" to test a variety of decontamination techniques. These included a mechanical approach, using brushes inside pipes, a high-powered vacuum machine and a pressure washer device known as a hydrolaze, with a pressure of 20,000 pounds per square inch (see photos on page 3). According to Peecook, workers cleaned pipes of varying lengths and with diameters ranging from four to ten inches. Overall, proof of process was successful, with Peecook noting, "There's nothing that we can't clean…with just a few passes," of the equipment.

After careful consideration, the Evaluation Team recommended a building-by-building approach. In some, decontamination will be emphasized while in others, removal and shipment of contaminated material will be stressed. Peecook noted that the NASA Decommissioning Team "generally concurred" with the team's recommendation, making a similar recommendation to NASA senior management.

The Path Forward.

According to Decommissioning Project Manager Tim Polich, NASA now "has a way of effectively dealing with the piping in Reactor Facility buildings," but he noted that the cost of implementing this approach exceeds the remaining funds available for 2006 and 2007. He also acknowledged that previous

Continued on page six.

In this photo upper left of this article, workers used a probe equipped with a video camera and a radiation monitor to survey embedded piping for contamination. At the bottom of this photo, they are shown examining the probe and looking into a video monitor (at the center of the photo).

Take a Look at What We Have Accomplished.

Segmentation.

NASA's signature achievement to date was accomplished in February, with the completion of all reactor segmentation activity. During the 18 months of segmentation work, NASA removed all the internal components of the reactor tank, including the core box, then cut the tank into pieces, packaging and sending the pieces to the Envirocare licensed disposal facility in Utah.

In this photo from November 2004, NASA has removed two-thirds of the reactor tank. The photo shows a worker on a ladder (bottom right of photo) near the floor of the tank.

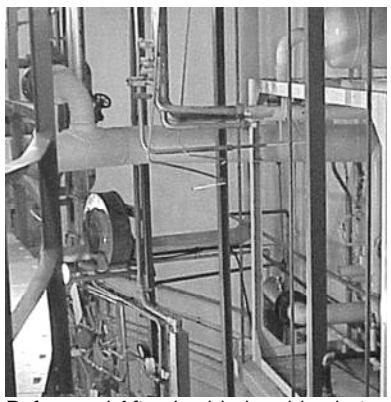
In this photo from last winter, an asbestos removal worker stands near a special cutting machine (at the right of the photo). In the last stages of segmentation, workers alternated between making cuts from the tank and removing asbestos.

A segmentation worker in the lower right of this photo is shown using a high-powered, plasma-arc torch, reducing the size of steel pieces from the reactor tank walls for easier packaging. The cutting took place in a work station located in one of the former canals in the Reactor Facility.

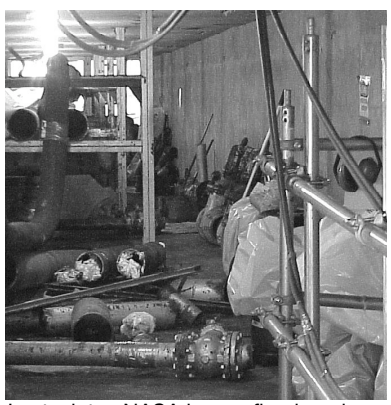
Cut pieces of the reactor tank walls sit on the floor of the Reactor Facility canal at the bottom of the photo, where they awaited packaging and shipment to Envirocare.

Fixed Equipment Removal.

In 2005 NASA removed, packaged and shipped more than four million pounds of fixed equipment, including wires, pipes, pumps, racks and railings. Work was done in the Containment Vessel (see July 2005 edition) and both the Hot and Cold Retention Areas, which contained tanks used for holding water contaminated from reactor activities when the facility was operational.



Before and After. In side-by-side photos are pictures of fixed equipment removal in the annulus. The photo at the left shows a variety of equipment, including piping, racks and a railing, all adjacent to the building wall. The photo at the right shows the bare wall, once all equipment was removed.



Last winter, NASA began fixed equipment removal in the Hot Retention Area. In this photo, a variety of fixed equipment sat atop the Hot Retention Area, a structure that was 90% underground. Fixed equipment to be removed included heavy racks and piping at the upper left and lower right of the photos.

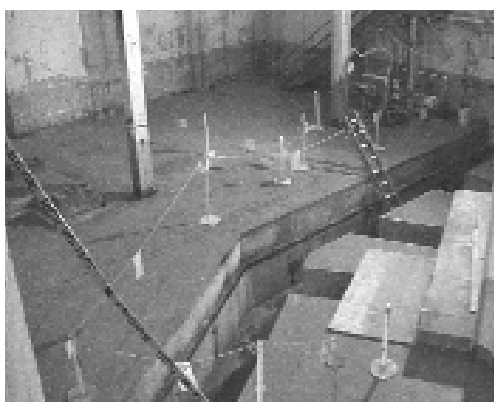
Before NASA could remove fixed equipment from the Cold Retention Area (CRA), workers had to pump out clean groundwater that had accumulated in the CRA's two basins. In this photo a hose is used to pump water out of the CRA which is under the cover in the center of the photo.

Once water had been pumped out of the basins in the Cold Retention Area, workers removed equipment from the floor, including a ladder in the upper right corner of the photo.

Decontamination of Embedded Piping.

Early in 2005, NASA began work on the decontamination of embedded piping systems (see article on page one). NASA stopped work in February to evaluate better approaches to decontamination and test out several techniques, all of which proved effective.

Workers used a probe - seen at the center of photo - to remove mud and dirt from embedded piping during early survey work.



NASA set up a "proof of process" cleaning area at the minus 25 foot level of the Reactor Building, in a pipe trench in the foreground of this photo.

During “proof of process,” NASA tested a variety of decontamination techniques. They included a high-powered vacuum (the pumping machine shown in the foreground) and a pressure washer known as a “hydrolaze,” whose pumping machine is in the upper right background of this photo.

Soil Excavation and Removal.

During the spring and summer, NASA excavated, packaged and shipped 10 million pounds of soil (see article on page six). NASA placed the soil in special fabric bags that had a capacity of 15,000 pounds each. In order to ensure safety, NASA used a capacity of just 5,000 pounds each. All of the bags were numbered and weighed, then placed in containers known as “Super Sacks” for shipment by truck to a rail yard in Willard, and then by train to Envirocare. NASA continually monitored the remaining soil to ensure that it met project cleanup standards.

Two pieces of excavation equipment - a backhoe (with its arm extended for digging) and a smaller skid mover - excavate soil in the emergency retention basin.

A skid loader deposits excavated soil into numbered bags before shipment.

In this photo a front-end loader is about to place a Super Sack on a scale for weighing, prior to departure from Plum Brook Station.

Flatbed trucks loaded with Super Sacks depart Plum Brook Station for a rail yard in Willard.

This photo shows an air monitor atop a berm in the Emergency Retention Basin. NASA continually monitors both the air and the unexcavated soils to make sure they are clean.

Decommissioning by the Numbers.

8,000,000 pounds of low-level radioactive waste (in the form of loose and fixed equipment) removed, packaged and shipped to the Envirocare licensed disposal facility (project total).

4,000,000 pounds removed, packaged and shipped in 2005.

10,000,000 pounds of soil - lightly contaminated from former reactor operations - removed, packaged and shipped to Envirocare (all in 2005).

10,022 curies of radiation sent to licensed disposal facilities - mostly to Barnwell, SC - since decommissioning began. A curie is a measure of radiation content. The shipments to Barnwell accounted for 97% of the radiation on site at the start of decommissioning. Now, more than 98% has been removed.

821,394 pounds of free-released material, mostly clean metals from Reactor Facility buildings, that can be recycled (project total).

18,265 pounds free-released in 2005.

10,000 feet of embedded piping surveyed for radiation content and condition

575 project work days (as of September 30, 2005) without a worker lost time accident.

Decommissioning Update (Continued from page one).

project delays and changes – while necessary to ensure safety – had added to decommissioning costs. "Given these realities," Polich explained, "NASA has been determining the best way to proceed," noting that in July, the agency sent a letter to the NRC, indicating it would need until 2010 to complete decommissioning. In keeping with its commitment to share information with the community, NASA briefed members of the Community Workgroup and the general public at the Workgroup's quarterly meeting in July – just days after informing the NRC – and the briefing met with a positive response.

To keep the project moving forward while making the best use of available funds, Polich said MWH Constructors is now close to completing demobilization. "With so much of the work complete, we now have a different project," he observed. Looking ahead to 2006, he said NASA would focus on "eliminating the remaining project risks and unknowns," using smaller crews (6-8 workers) to undertake fixed equipment removal in three small rooms known as Hot Cells (where reactor experiments on metals had once been evaluated) and ongoing characterization work.

According to Polich, the Decommissioning Team has "a firm commitment from NASA to continue to provide funding for the project." By 2007 NASA will prepare "a very complete timeline and Request for Proposals" to finish the project and likely award a contract late in 2007. In addition to decontamination, demolition and shipping the waste, future work will include removing another 8 million pounds of soil. In spite of the time delay, Polich reiterated NASA's commitment to "finish the job safely, protect the public, the workers and the environment, and achieve the goal of unrestricted release to terminate the existing NRC license." ■

NASA Completes Fixed Equipment Removal & First Phase of Soil Removal.

The buildings and structures that comprised the Reactor Facility may be filled with memories, but they are otherwise virtually empty as NASA is completing fixed equipment removal (FER). In August, workers removed a large rubber floor lining and electrical conduits from the Cold Retention Area, a structure that consisted of two concrete tanks once used to hold water contaminated from reactor operations (until radiation levels had been sufficiently reduced to allow for safe discharge). Workers also began characterization of the concrete and subsoil to determine how much will eventually be removed to meet project cleanup standards.

The near completion of FER operations coincided with another Decommissioning Project milestone, the removal of 10 million pounds of soil that had become lightly contaminated from water used in reactor operations (from 1962 to 1973). Workers excavated and packaged the soil from the Emergency Retention Basin, a large earthen diked area that had, on rare occasions, also been used to hold water contaminated from reactor operations; and from Area 1A, which included both land inside the Plum Brook Station fence line adjacent to the Reactor Facility, and the Pentolite Ditch (see July 2005 edition). A second phase of soil removal will take place later in the project.

NASA shipped the packaged soil by truck to a rail yard in Willard. In addition to providing advance notification of all shipments to Erie County public safety officials, NASA coordinated with public safety officials in Huron County, where the rail transfer station is located, including Huron County Director of Emergency Management, Bill Ommert, who is also a member of the Decommissioning Community Workgroup.

According to Senior Project Engineer Keith Peecook, the removal of fixed equipment and soil is "a major project accomplishment." He said that NASA has constantly monitored radiation levels during soil excavation, such that what soil remains in this area "meets and goes beyond project cleanup standards. This helps ensure that when the NRC does its final site verification of our cleanup levels – we will meet our project goals." ■

In the photo in the upper right corner An aerial view of the Emergency Retention Basin (ERB), one of the primary soil excavation areas. This photo shows vehicle access at the upper right and lower left corners of the ERB and sacks for excavated soil at the lower left.